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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/673,473	09/30/2003	Makoto Matsushima	R2180.0180/P180	1533

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Washington, DC 20037

EXAMINER
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HAROON, ADEEL

ART UNIT	PAPER NUMBER
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2685

DATE MAILED: 02/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/673,473	<b>Applicant(s)</b> MATSUSHIMA ET AL.	
	<b>Examiner</b> Adeel Haroon	<b>Art Unit</b> 2685	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

**A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.**

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-6 is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____.  |

## **DETAILED ACTION**

### ***Claim Objections***

1. Claim 4 is objected to because of the following informalities: The word "battery is misspelled as "batter" in claim 4, line 3. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al. (U.S. 6,801,894) in view of Satoh et al. (6,643,527).

With respect to claim 1, Nakamura et al. disclose an amplifying circuit with a signal ground generating device, element number 18a, configured to generate and output a signal ground by changing the reference voltage, VDD from the power supply (Column 4, lines 1-7). Nakamura et al. also disclose at least one operational amplifier

configured to amplify and output a signal having a prescribed waveform, said operational amplifier using the power source, VDD, as a driving power source, wherein the signal ground is positioned at a center of a vibration amplitude of the waveform (Column 4, lines 1-7). Nakamura et al. teach keeping the signal ground voltage at half of the power supply voltage, but do not expressly disclose a regulator for controlling the battery power source and controlling functions according to the deterioration of the battery. However, Satoh et al. disclose a battery monitoring system in figure 2. Satoh et al. teach a regulator to regulate an output of the battery power source, to generate a reference voltage, and adjusting the voltage supplied according to the deterioration of the battery (Column 2, lines 1-5). Therefore, it would be obvious to one of ordinary skill in the art at the time of the applicant's invention to adjust the signal ground voltage according to the deterioration of the battery source as taught by Satoh et al. of the amplifier system of Nakamura et al. in order to provide a better operating functions as the supply voltage from the battery drops.

With respect to claim 2, the modified amplifier system of Nakamura et al. and Satoh et al. is described above in the discussion of claim 1. Satoh et al. also disclose a control section configured to output a control signal when the power source deteriorates to a prescribed level (Column 2, lines 15-21). Satoh et al. further disclose a resistance division circuit, element number 40, configured to divide the reference voltage at a prescribed rate (Column 3, lines 49-56). Therefore, it would be obvious to one of ordinary skill in the art at the time of the applicant's invention to use the control section and resistance division circuit of Satoh et al. to produce the signal ground voltage in

accordance with the deterioration of the battery source in the modified amplifier system of Nakamura et al. and Satoh et al. in order to provide a better operating functions as the supply voltage from the battery drops.

With respect to claim 3, the modified amplifier system of Nakamura et al. and Satoh et al. is described above in the discussion of claims 1 and 2. Satoh et al. further disclose the control section including a CPU, element number 61, and a RAM, element number 62, wherein the RAM stores data of prescribed deterioration level of the power source and the CPU controls the section to output the control signal when the battery power source deteriorates to the prescribed deterioration level (Column 4, lines 44-55). Therefore, it would be obvious to one of ordinary skill in the art at the time of the applicant's invention to apply the control section of Satoh et al. to produce the signal ground voltage in accordance with the deterioration of the battery source in the modified amplifier system of Nakamura et al. and Satoh et al. in order to provide a better operating functions as the supply voltage from the battery drops.

With respect to claim 4, the modified amplifier system of Nakamura et al. and Satoh et al. is described above in the discussion of claims 1 and 2. Satoh et al. further disclose a plurality of comparators, element number 40 and 50, each configured to compare a voltage of the battery power source with a unique reference voltage (Column 3, line 49 – Column 4, line 13). Therefore, it would be obvious to one of ordinary skill in the art at the time of the applicant's invention to apply the control section of Satoh et al. to produce the signal ground voltage in accordance with the deterioration of the battery

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source in the modified amplifier system of Nakamura et al. and Satoh et al. in order to provide a better operating functions as the supply voltage from the battery drops.

With respect to claim 5, the modified amplifier system of Nakamura et al. and Satoh et al. is described above in the discussion of claim 1. Nakamura et al. further disclose a speaker driven by the power source (Column 5, lines 4-9).

With respect to claim 6, Nakamura et al. disclose a mobile information terminal with a speaker driven by a power source (Column 5, lines 4-9). Nakamura et al. disclose signal ground generating device, element number 18a, configured to generate and output a signal ground by changing the reference voltage, VDD from the power supply (Column 4, lines 1-7). Nakamura et al. also disclose at least one operational amplifier configured to amplify and output a signal having a prescribed waveform, said operational amplifier using the power source, VDD, as a driving power source, wherein the signal ground is positioned at a center of a vibration amplitude of the waveform (Column 4, lines 1-7). Nakamura et al. teach keeping the signal ground voltage at half of the power supply voltage, but do not expressly disclose a regulator for controlling the batter power source and controlling functions according to the deterioration of the battery. However, Satoh et al. disclose a battery monitoring system in figure 2. Satoh et al. teach a regulator to regulate an output of the battery power source, to generate a reference voltage, and adjusting the voltage supplied according to the deterioration of the battery (Column 2, lines 1-5). Therefore, it would be obvious to one of ordinary skill in the art at the time of the applicant's invention to adjust the signal ground voltage according to the deterioration of the battery source as taught by Satoh et al. of the

mobile information terminal of Nakamura et al. in order to provide a better operating functions as the supply voltage from the battery drops.

### ***Conclusion***

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ng et al. (U.S. 6,954,537) and Sharp et al. (U.S. 6,757,526) disclose amplifier system that sets the operation of the amplifier in accordance to the battery level. Maejima et al. (U.S. 6,696,877) disclose a level shift circuit that shifts the reference voltage of operational amplifiers.

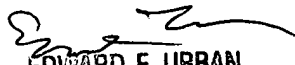
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Adeel Haroon whose telephone number is (571) 272-7405. The examiner can normally be reached on Monday thru Friday, 8:30 a.m. - 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Urban can be reached on (571) 272-7899. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AH  
1/30/06

  
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